


GENERAL DESIGN GUIDELINES

19-1 WATER MAIN & SANITARY SEWER SHEET

- 1 SHOW PLAN VIEW WITH EXISTING WORK AND PROPOSED RELOCATION OF WATER MAIN AND SANITARY SEWER. SHOW ABANDONMENT OF OLD WATER MAIN AS . SHOW REMOVAL OF OLD SANITARY SEWER. SHOW PROPOSED WATER MAIN AND SANITARY SEWER.
- 2 PROFILE OF PROPOSED SANITARY SEWER RELOCATION. LOCATIONS OF TRENCH DETAIL TYPE SHOULD BE PLACED ON THE TYPE LINE.
- 3 PROFILE OF PROPOSED WATER MAIN RELOCATION. LOCATIONS OF TRENCH DETAIL TYPE SHOULD BE PLACED ON THE TYPE LINE.
- 4 QUANTITIES THIS SHEET
- 5 PLACE NOTES SPECIFIC TO EACH CONSTRUCTION SHEET

19-2 WATER MAIN DETAIL SHEET

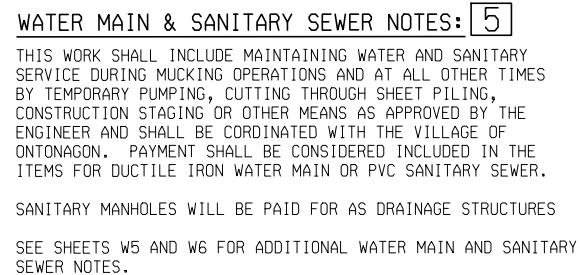
REVIEW NOTES AND REVISE AS NEEDED FOR THE PROJECT. PROVIDE DETAILS THAT ARE APPLICABLE TO THE PROJECT.

19-3 SANITARY SEWER AND WATER MAIN DETAIL SHEET

REVIEW NOTES AND REVISE AS NEEDED FOR THE PROJECT. PROVIDE DETAILS THAT ARE APPLICABLE TO THE PROJECT.

FOR SPECIFICATIONS AND ADDITIONAL DESIGN INFORMATION CONTACT DESIGN SUPPORT AREA - MUNICIPAL UTILITIES UNIT FOR ANY PROJECT INVOLVING RELOCATION OF MUNICIPAL UTILITIES.

EX ESCANABA &  
LAKE SUPERIOR RR



PLAN

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SCALE: 1" = 40'



Score Range	Shaded Frequency	Unshaded Frequency	Total Frequency
0 - 20	2	2	4
20 - 40	1	0	1

WATER MAIN &amp; SANITARY SEWER SHEET W1 OF 6

REL E &amp; LS RR AT M-64 (RELOCATED)

DESIGN UNIT

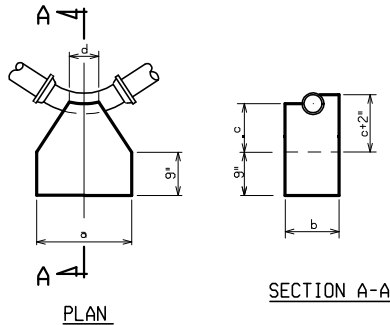
1-91

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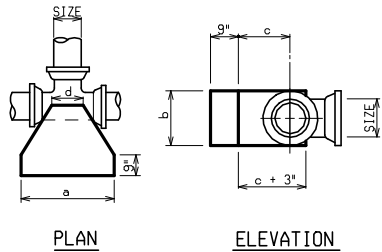
SHEET NO.	
R.O.W	CONST.

FINAL R.O.W.			
AUTH	DATE	NO.	REVISION



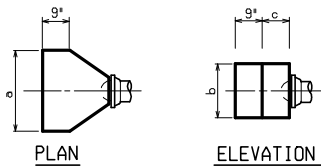
SIZE OF BEND	DEGREE OF BEND	DIMENSIONS				CONC. CYD
		a	b	c	d	
6"	90°	2'-6"	1'-9"	1'-0"	0'-9"	0.23
8"	90°	3'-4"	2'-6"	1'-0"	1'-2"	0.44
12"	90°	5'-0"	3'-0"	1'-4"	1'-8"	0.90
16"	90°	5'-6"	4'-6"	2'-0"	2'-3"	1.94
6"	45°	2'-4"	1'-8"	0'-10"	0'-9"	0.19
8"	45°	2'-4"	2'-0"	1'-0"	1'-4"	0.27
12"	45°	3'-6"	2'-6"	1'-4"	1'-4"	0.53
16"	45°	5'-0"	3'-0"	1'-9"	2'-0"	1.07
20"	45°	6'-0"	3'-9"	2'-0"	2'-0"	1.65
6"	22-1/2°	2'-0"	1'-6"	0'-9"	0'-9"	0.14
8"	22-1/2°	2'-2"	1'-6"	0'-9"	1'-2"	0.16
12"	22-1/2°	2'-6"	2'-0"	1'-0"	1'-4"	0.27
16"	22-1/2°	3'-4"	2'-6"	1'-9"	1'-2"	0.58
20"	22-1/2°	4'-0"	3'-0"	2'-0"	1'-8"	0.88
6"	11 1/4°	2'-0"	1'-3"	0'-9"	0'-9"	0.12
8"	11 1/4°	2'-0"	1'-3"	0'-9"	1'-2"	0.12
12"	11 1/4°	2'-3"	1'-9"	1'-0"	1'-4"	0.22
16"	11 1/4°	3'-0"	2'-3"	1'-6"	1'-4"	0.44
20"	11 1/4°	3'-6"	2'-6"	1'-6"	1'-8"	0.53

DETAIL OF STD. THRUST BLOCKS  
FOR BENDS  
(NO SCALE)



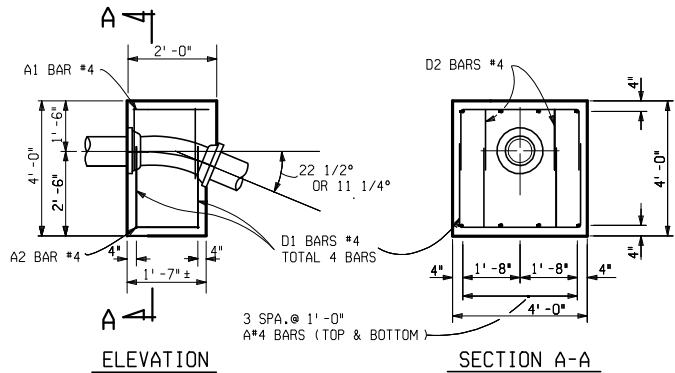
SIZE	DIMENSIONS				CONC. CYD.
	a	b	c	d	
6"	2'-6"	1'-0"	1'-3"	1'-0"	0.15
8"	3'-0"	2'-0"	1'-4"	1'-0"	0.33
12"	4'-0"	3'-0"	1'-10"	1'-4"	0.86
16"	5'-0"	4'-0"	2'-9"	1'-10"	1.95
20"	6'-0"	5'-0"	4'-0"	2'-6"	3.98

DETAIL OF STD. THRUST BLOCKS  
FOR TEES & Y'S  
(NO SCALE)



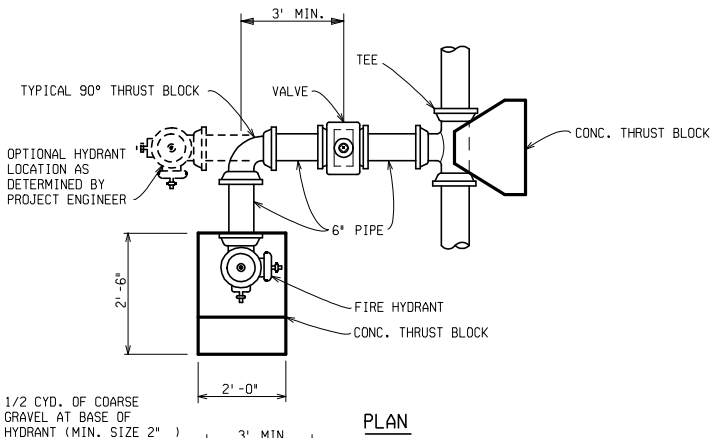
DIMENSIONS				CONC.
SIZE	a	b	c	CYD.
6"	2'-6"	1'-0"	1'-3"	0.15
8"	3'-0"	2'-0"	1'-4"	0.36
12"	4'-0"	3'-0"	1'-10"	0.86
16"	5'-0"	4'-0"	2'-9"	1.91
20"	6'-0"	5'-0"	4'-0"	3.67

DETAIL OF STD. THRUST BLOCKS  
FOR PLUGS  
(NOT TO SCALE)



DETAIL OF VERT. THRUST BLOCK  
FOR TOP 12"-22 1/2° BEND

STEEL REINFORCEMENT, WATER MAIN STRUCTURES 45 LBS (EACH BLOCK)					
BAR	LENGTH	a	b	* NO. REQ'D	D
A1	1'-6"			4	4
A2	1'-1"			4	4
D1	7'-9"	3'-1"	2'-4"	4	4
D2	5'-7"	11"	2'-4"	4	4



DETAIL OF HYDRANT INSTALLATION  
FOR PROPOSED HYDRANT  
(NO SCALE)

WATER MAIN NOTES:

- THE LOCATIONS AND ELEVATIONS OF EXISTING WATER MAINS ARE SHOWN IN ACCORDANCE WITH AVAILABLE DATA AND NO GUARANTEE IS MADE FOR EITHER THE COMPLETENESS OR ACCURACY OF THOSE MAINS SHOWN. IT IS ANTICIPATED THAT THE CONTRACTOR MAY NEED TO EXPOSE THE WATER MAINS TO DETERMINE ACTUAL LOCATIONS AND ELEVATIONS
- WHERE DEPTH OF COVER ELEVATIONS FOR EXISTING WATER MAINS WERE NOT AVAILABLE, EXISTING PROFILES ARE SHOWN BASED ON AN ASSUMED AVERAGE DEPTH OF COVER OF 6.0' AND GRADES OF THE PROPOSED WATER MAINS ARE SUBJECT TO CHANGE TO SUIT THE ACTUAL ELEVATIONS OF THE EXISTING WATER MAINS
- ELEVATIONS OF PROPOSED WATER MAINS SHOWN ON THE PROFILES ARE BOTTOM OF PIPE ELEVATIONS UNLESS OTHERWISE SHOWN.
- OTHER UTILITIES MAY BE MAKING ALTERATIONS TO THEIR EXISTING SYSTEMS IN THE VICINITY OF THE WATER MAIN CONSTRUCTION SHOWN ON THE PLANS. THESE UTILITIES SHOULD BE CONSULTED FOR THE LATEST INFORMATION REGARDING THE LOCATION OF THEIR FACILITIES.
- PROPOSED WATER MAINS SHALL BE DUCTILE IRON PIPE PRESSURE CLASS 350. THICKNESS CLASS NO. 54.
- ALL WATER MAINS SHALL BE INSTALLED WITH A MINIMUM 6.0' COVER. THE NEW WATER MAINS SHALL BE TESTED AND CHLORINATED PRIOR TO BEING INTEGRATED INTO THE SYSTEM.
- FITTINGS REQUIRED TO CONNECT PROPOSED WATER MAIN TO EXISTING WATER MAIN SHALL BE FIELD VERIFIED PRIOR TO CONSTRUCTION AND SHALL BE INCLUDED IN THE COST OF THE WATER MAIN PAY ITEM. THE CONTRACTOR SHALL FIELD VERIFY THE TYPES OF EXISTING WATER MAINS PRIOR TO ORDERING CONNECTION FITTINGS
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE DONE TO THE EXISTING WATER MAIN WHILE MAKING CONNECTIONS. ANY ADDITIONAL WATER MAIN REQUIRED TO REPAIR DAMAGE INCURRED WHILE MAKING CONNECTIONS TO EXISTING WATER MAINS SHALL BE AT THE CONTRACTOR'S EXPENSE.
- ALL PIPE NOT CHLORINATED AS PART OF THE NORMAL DISINFECTING PROCEDURES SHALL BE HAND CHLORINATED. THIS SHALL INCLUDE ALL PIPE USED FOR CLOSURES AND CONNECTIONS. THIS OPERATION WILL BE INCLUDED AS PART OF THE PROPOSED WATER MAIN CONSTRUCTION.
- THRUST BLOCKS SHALL BE POURED AGAINST UNDISTURBED EARTH. ALL THRUST BLOCKS SHALL TERMINATE AT THE FACE OF THE PIPE BELLS.
- IT IS ANTICIPATED THAT TRENCH BOXES OR OTHER SHEETING AND SHORING METHODS WILL BE NECESSARY TO CONSTRUCT THE WATER MAIN. THESE ITEMS, IF NECESSARY, SHALL BE INCLUDED IN THE PAYMENT PER LINEAR FOOT OF WATER MAIN.
- LOCATIONS AND ELEVATIONS OF POTENTIAL STORM SEWER CONFLICTS SHALL BE FIELD VERIFIED PRIOR TO WATER MAIN CONSTRUCTION. FITTINGS REQUIRED TO AVOID CONFLICT ARE INCLUDED IN THE COST OF WATER MAIN AND WILL NOT BE PAID FOR SEPARATELY.
- WHEN PROPOSED WATER MAIN PASSES BENEATH EXISTING SEWERS/UTILITIES, TEMPORARY SUPPORT OF EXISTING SEWERS/UTILITIES IS INCLUDED IN THE COST OF WATER MAIN PAY ITEMS.
- REMOVAL OF ABANDONED WATER MAINS AS REQUIRED FOR CLEARANCE TO CONSTRUCT THE PROPOSED WATER MAINS SHALL BE INCLUDED AS PART OF THE PROPOSED WATER MAIN CONSTRUCTION.
- ON ALL WATER MAINS THAT ARE ABANDONED, VALVES NO LONGER NEEDED SHALL BE REMOVED, AND SHALL REMAIN THE PROPERTY OF THE VILLAGE OF ONTONAGON.
- ALL MAINS ABANDONED SHALL BE CUT TWO FEET FROM MAIN OR VALVE AND PLUGGED WITH RETAINING GLANDS AND BULKHEADED.
- HYDRANTS SHALL BE VILLAGE OF ONTONAGON STANDARD EAST JORDON IRON WORKS MODEL 5-BR
- ALL HYDRANTS SHALL BE PAINTED RED ABOVE GROUND AND BLACK BELOW, WITH A FINISH COAT OF GLAMORTEX 501 ENAMEL, COLOR 314-VERMILLION, OR APPROVED EQUAL; HYDRANT CAPS SHALL BE PAINTED THE SAME AS HYDRANT BODY
- GATE VALVES SHALL BE IRON BODY, FULLY BRONZE MOUNTED, RESILIENT WEDGE DISK, TAPERED SEATS, NON-RISING STEM, OPENING COUNTER-CLOCKWISE, WATEROUS 500 MODEL, OR APPROVED EQUAL AND CONFORMING TO THE VILLAGE OF ONTONAGON WATER DEPARTMENT SPECIFICATIONS.

M-64 (RELOCATED) VILLAGE OF ONTONAGON	DATE		CONT. SEC.		JOB NO.		DESIGN UNIT		SHEET NO.	
	04/12/07								R.O.W CONST.	

DATE:

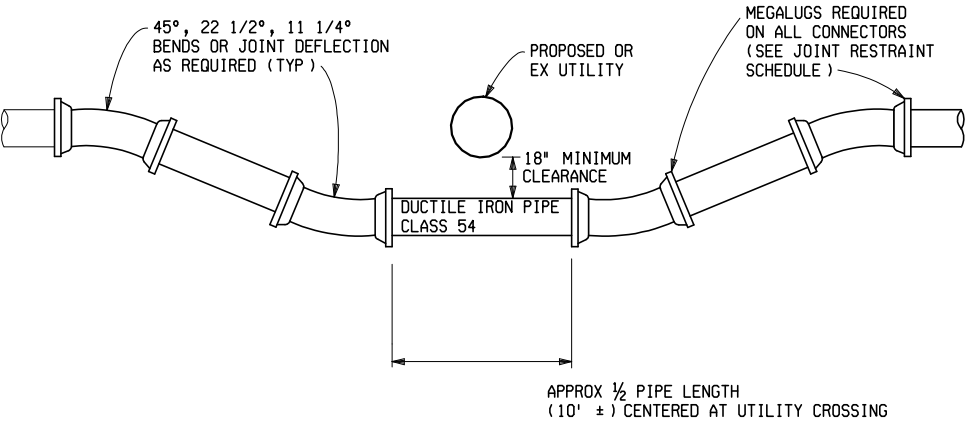
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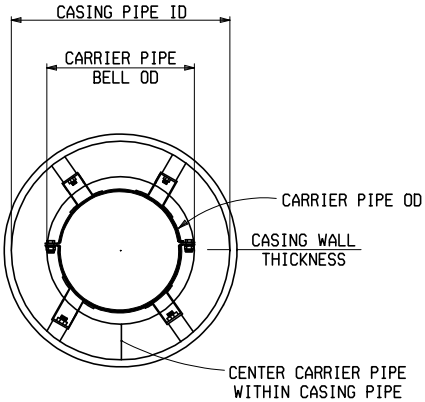
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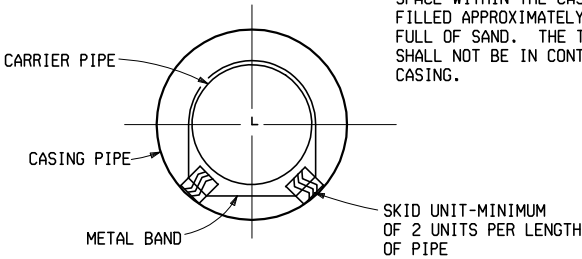
FINAL R.O.W.			
AUTH	DATE	NO.	REVISION



WATER MAIN - UTILITY CROSSING DETAIL  
(NO SCALE)

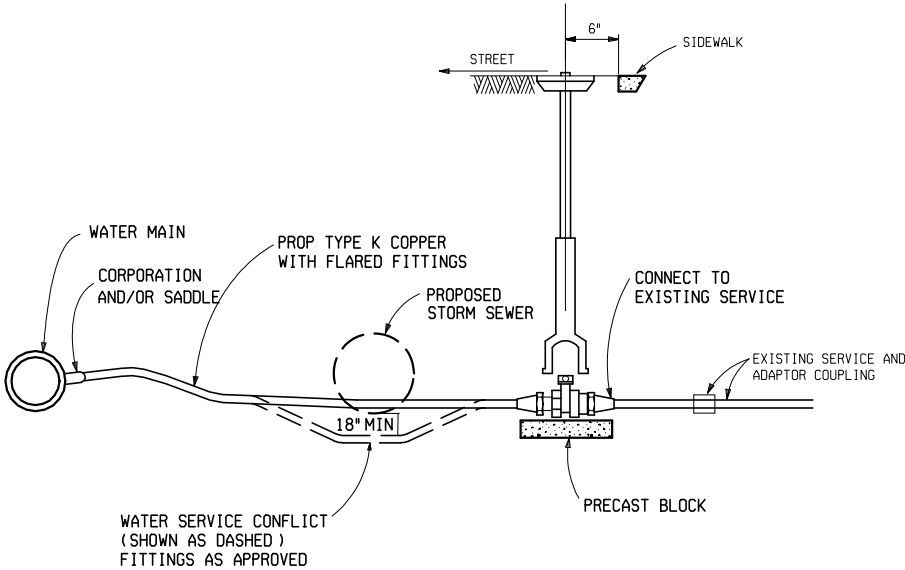


B ) SKID UNITS



NOTE:  
WHEN USING SKID UNITS, THE ANNULAR SPACE WITHIN THE CASING SHALL BE FILLED APPROXIMATELY TWO THIRDS FULL OF SAND. THE TOP OF THE PIPE SHALL NOT BE IN CONTACT WITH THE CASING.

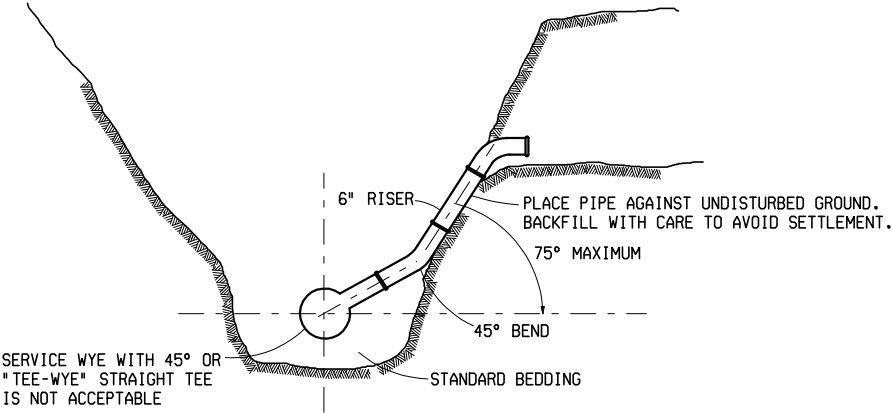
CASING PIPE DETAIL  
(NO SCALE)



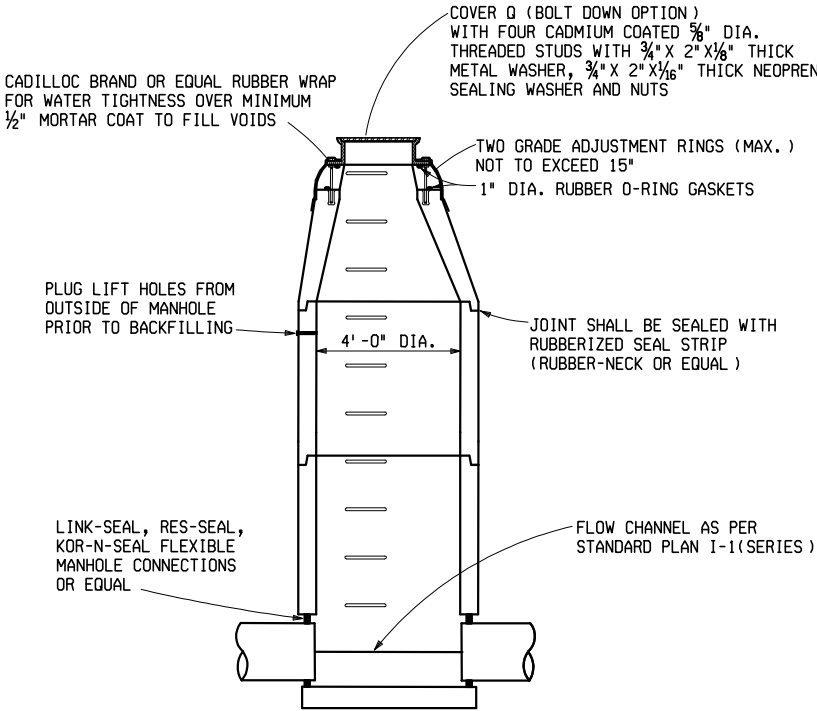
WATER SERVICE CONNECTION  
& WATER SERVICE CONFLICT  
(NOT TO SCALE)

SERVICE NOTES:

- SERVICE SHALL INCLUDE CORPORATION STOP, CURB STOP AND BOX, AND TYPE K COPPER CONNECTED TO EXISTING SERVICES.
- THIS DETAIL APPLIES FOR SERVICES NOT LARGER THAN 2". MINIMUM SIZE IS 1".



TYPICAL SEWER LEAD  
(NOT TO SCALE)



SANITARY MANHOLE DETAIL  
(NOT TO SCALE)

SANITARY SEWER NOTES:

THIS WORK SHALL INCLUDE CONSTRUCTION OF ALL SEWERS, COMPLETE AS SHOWN ON THE PLANS AND AS DESCRIBED IN SECTION 402 OF THE 2003 STANDARD SPECIFICATIONS FOR CONSTRUCTION.

SANITARY SEWERS SHALL HAVE ELASTOMERIC GASKET PUSH ON TYPE JOINTS. THE JOINT SHALL CONFORM TO ASTM DESIGNATION D 3212.

IT IS ANTICIPATED THAT TRENCH BOXES OR OTHER SHEETING AND SHORING METHODS AND DEWATERING WILL BE NECESSARY TO CONSTRUCT THE SANITARY SEWER. THESE ITEMS, IF NECESSARY SHALL BE INCLUDED IN PAYMENT FOR PVC SANITARY SEWER.

SANITARY MANHOLES SHALL BE PAID FOR AS DRAINAGE STRUCTURES.

PREMIUM JOINTS ARE REQUIRED ON ALL SANITARY MANHOLES AND SHALL BE IN ACCORDANCE WITH ASTM C443. MANHOLES SHALL BE PRECAST CONCRETE WITH INTEGRAL BASES (ASTM C 478 ).

BOLTED DOWN COVER Q SHALL BE USED ON ALL SANITARY SEWERS.

THE EXTERIOR OF THE DRAINAGE STRUCTURE MUST BE WATERPROOFED AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 402 OF THE 2003 STANDARD SPECIFICATION FOR CONSTRUCTION AND MDT STANDARD PLAN R-1 SERIES.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE DONE TO THE EXISTING SANITARY SEWER WHILE MAKING CONNECTIONS. ANY ADDITIONAL SANITARY SEWER REQUIRED TO REPAIR DAMAGE INCURRED WHILE MAKING CONNECTIONS TO EXISTING SANITARY SEWER SHALL BE AT THE CONTRACTOR'S EXPENSE.

ADJUSTMENT OF SANITARY MANHOLES COVERS SHALL BE PAID FOR AS ADJUSTING DRAINAGE STRUCTURE COVER.

SANITARY SEWER & WATERMAIN DETAIL SHEET W6 OF 6



M-64 (RELOCATED ) VILLAGE OF ONTONAGON

DATE	CONT. SEC.	JOB NO.	DESIGN UNIT	SHEET NO.
04/12/07				R.O.W CONST.

DATE:

WORKED ON BY:

DATE:

CHECKED BY:

FILE NAME:

19-3